DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5, 7-9 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka (US 6,246,524) or Yamazaki et al (US 6,291,320) in view of Tanaka (US 6,393,042), Okamoto et al (JP 2003-287704), and Ogawa et al (US 7,753,548) or Sakai et al (US 2003/0063630).

Tanaka '524 or Yamazaki shows the method and apparatus claimed including a laser oscillator emitting a laser beam, a beam homogenizer for homogenizing the laser into a second beam wherein the second beam passes through a first condensing lens and second condensing lens wherein the second lens is in a conjugate relation with a irradiation surface where the second beam enters the irradiation surface. Tanaka '524 or Yamazaki shows the beam homogenizer that is in form of a cylindrical lens array and the condensing lens that are convex cylindrical lens. Tanaka '524 further shows that the laser can be a gas laser such as an Ar laser or a solid-state laser such as a YAG laser wherein the second beam is moved with respect to the irradiation surface, and Tanaka '524 also shows the applications of its laser irradiation method in the video camera, a digital camera, and among other uses. Tanaka '524 also shows a slit 205 wherein the

beam projecting from the slit can be a third laser beam that passes through a condensing lens and a projection lens, such as the second condensing lens, that is in a conjugate relation with the irradiation surface.

But, Tanaka '524 and Yamazaki do not show that the laser is a solid-state laser having the spectral width of .1 nm or lager and that the solid-state oscillator includes a crystal of ceramic, and neither Tanaka '524 nor Yamazaki explicitly shows the slit to block an end portion of the second laser beam in a major-axis direction of the laser beam.

Okamoto shows the method and apparatus claimed including a silicon film irradiate with a laser having a solid-state laser oscillator such as a Nd:YAG laser having a laser beam with a spectral width of 0.1 nm or more into a second beam after passing through a beam homogenizer which includes a homogenizer such as cylindrical lens array wherein the second beam is condensed with a condensing lens into a third beam that is irradiated on an irradiation surface. The irradiated beam is moved relative to the irradiation surface of the film.

Tanaka '042 shows it is known in the art that a slit (205) is provided to block an end portion of the laser beam in a major-axis direction of the beam to form a linear shape. Also see Figure 2.

Ogawa or Sakai shows that a solid-state laser using Nd ion or Yb ion doped crystal an excitation medium is well known in the art.

In view of Tanaka '042, it would have been obvious to one of ordinary skill in the art to adapt Tanaka '524 or Yamazak, with the slit that is known in the art to block the

ends of the laser beam to allow the laser beam into a linear rectangular shape that would provide more uniform laser beam density resolution.

In view of Okamoto, it would have been obvious to one of ordinary skill in the art to adapt Tanaka '524 or Yamazaki with the solid-state laser having the recited spectral width that is well known in the art as an alternative laser oscillator that can provide a suitable alternative laser beam for a uniform laser irradiation; and in view of Ogawa or Sakai, it would have been obvious to adapt Tanaka '524 or Yamazaki with the laser oscillator having a ceramic crystal that is Nd ion or Yb doped crystal as the laser emitting medium which is well known in the art.

With respect to the recitation of forming a crystal grain grown continuously in a moving direction with a first irradiation region and a second irradiation region that are overlapped, Tanaka '524 shows the overlapped region as shown in Figure 16B, and the formation of the crystal grain would have been obvious result or predictable result to the irradiation surface by the modified laser beam of Tanaka '524 or Yamazaki in view of Okamoto as matter of routine process of the laser irradiation which also meets the recited method steps.

3. Claims 6, 17-20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka '524 or Yamazaki in view of Tanaka '042, Okamoto, and Ogawa or Sakai, as applied to claims 1-5, 7-9 and 11-16 above, and further in view of Tanaka et al (US 6,545,248).

Tanaka '524 or Yamazaki in view of Tanaka '042, Okamoto and Ogawa or Sakai, shows the method and apparatus claimed except for the laser beam that is converted by a non-linear optical element.

Tanaka '248 shows that it is well known in the art to provide a non-linear optical element to convert a fundamental into a second harmonic.

In view of Tanaka '248, it would have been obvious to one of ordinary skill in the art to adapt Tanaka '524 or Yamazaki, as modified by Tanaka '042, Okamoto, and Ogawa or Sakai, with a non-linear optical element to produce a fundament wavelength to into a harmonic wavelength that further provide a more uniform energy laser beam.

Response to Arguments

4. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SANG Y. PAIK whose telephone number is (571) 272-4783. The examiner can normally be reached on M-F (9:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Hoang can be reached on (571) 272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SANG Y PAIK/

Primary Examiner, Art Unit 3742